TEACHERS' REFLECTIONS IN THE USE OF LEARNING TECHNOLOGIES IN INCLUSIVE EDUCATION

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ABSTRACT – The aim of this study is to explore teachers' reflections on the use of learning technologies in inclusive education that is, in a school of learners with special educational needs (LSEN). We argue that steady progress has been made to enhance inclusive education in schools over many years towards educating more children with special educational needs in mainstream schools, particularly children not only with demanding learning difficulties but physical, mental and sensory handicaps. By the same token, learning technologies are being introduced and accepted in diverse educational contexts, offering opportunities for innovation and for making learning processes more encompassing, engaging, and collaborative and above all, making the learning content more accessible for learners with learning disabilities. However, though learning technologies have been introduced and accepted in diverse educational contexts, little has been reported on teachers' reflection in and on the use of learning technologies in inclusive education, in Gauteng Province, West District. This enquiry employed a qualitative case study to capture six teachers' reflections in the use of learning technologies in inclusive education through observation, focus group interview, individual interviews and documentary sources. The collected data was analysed inductively through the theoretical framework of reflections. Results showed that teachers adapted the mainstream learning technologies curriculum to the level of learners who had positive learning experiences with technological tools. On the other hand, teachers acknowledged that they need professional development in the use of learning technologies in inclusive education.

Keywords: Information and Communications Technology, inclusive education, learning technologies, learners with special educational needs, reflection

INTRODUCTION

Dewey (1910) defined reflective thought as: "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends" (pp.6). Thus, reflective practitioners are teachers who can question themselves, reflect on their practices, build new pedagogical techniques when needed, and develop their expertise using continuously-acquired knowledge of the profession (Kayapinar, 2018). Pillay and TerlizziII (2009) contend that learners' learning difficulties or disabilities stem from poor focus and concentration, below average concrete and logical reasoning, poor fine motor skills as a result of low muscle tone, problems associated with visual perception and auditory discrimination, as well as a low self-esteem and social difficulties. Thus, the use of learning technologies in the classroom by teachers can make significant differences to life experiences of their learners and including those who are experiencing learning difficulties in the learning process (Dikusar, 2018).

BACKGROUND TO THE USE OF LEARNING TECHNOLOGIES IN INCLUSIVE EDUCATION

Inclusive education has the potential to improve learning outcomes of LSEN. These learners have varying cognitive, physical, emotional, and behavioural learning needs. They demonstrate diverse abilities and academic achievement (Kang & Martin, 2018; Szczytko, Carrier & Stevenson, 2018). In support for LSEN, the South African Department of Education (DoE, 2001) drafted a White Paper 6 on Inclusive Education to accommodate all learners with learning disabilities in schools. The justification of the White Paper 6 on inclusive education and training is to: (i) acknowledge that all children and youth can learn and need support; (ii) acknowledge and respect differences in learners while building on similarities; (iii) foster attitudes, behaviour, teaching methods, curricula and learning environments that meet the needs of all learners, and (iv) uncover and minimise barriers to learning.

The main objective of any education system in a democratic society is to provide quality education for all learners, including those with physical, mental and socioeconomic challenges, so that they will be able to reach their full potential and contribute meaningfully to society throughout their lives. According to Landsberg, Krüger and Swart (2019), everyone has the right to education.

South Africa has adopted an inclusive education policy in order to address barriers to learning in the education system. Similarly, inclusive education is seen as a process of addressing and responding to the diversity of needs of all learners through increasing participation in learning. It involves changes and modifications in content, approaches, structures and strategies, with a common vision which covers all children of the appropriate age range and a conviction that it is the responsibility of the regular system to educate all children (United Nations Educational, Scientific and Cultural Organization, 2005; British Educational Communication and Technology Agency (Becta), 2007). However, the implementation of this policy is hampered by the lack of teachers' skills and knowledge in differentiating the curriculum to address a wide range of learning needs (Dalton, Mckenzie & Kahonde, 2012; Conway, 2017). Therefore, in order to support teachers in the implementation of inclusive education, the South African DoE (2004) drafted a White Paper on e-Education which upholds that every South African learner should have access to the use of Information and Communications Technology (ICT)/learning technologies. These concepts, ICT/learning technologies are used interchangeably in the context of this study.

Other ICT policies include guidelines for teacher training and professional development in ICT (DoE, 2007), Gauteng Online ICT laboratory access (2005) and Circular 71/2008 for the integration of digital assets for teaching and learning (Gauteng Department of Education (DDE), 2008). All these policy documents are to leverage the learning technologies so as to improve learner outcomes and overcome some challenges that are known to exist and to identifying which teachers are in need of pedagogic assistance in Basic Education (Meyer & Gent, 2016). As a result, learning technologies have the potential to be valuable sources of knowledge, helpful teaching tools and motivators of learning for both teachers and learners in the classroom (Maré, 2019). Fransson, Lindberg and Olofsson (2018) and Maré (2019) report that technologies like Microsoft package (PowerPoint, MSWord, Excel, or Access), videos and sound files; tablets, smartboards, can be linked to computers, projectors and to the cloud so that learners and teachers can communicate through text, drawings and diagrams. Additionally, the GDE introduced smartboard (paperless) classrooms with a view to use mobile devices, such as tablets, to transform teaching and learning in the province (Sekhonyane, 2015) and certainly to keep learners engaged in their learning process (Pilane, 2017). However, teaching with learning technologies in inclusive education is a complex issue as teachers lack the necessary skills and knowledge to teach with them (Fernández-Batanero, Sañudo, Montenegro-Rueda, & García-Martínez, 2019; Hannaway, 2019). On the other hand, Lersilp and Lersilp (2019) argue that teachers need to reflect on their teaching practice in order to find a way of teaching with learning technologies in their teaching practice.

This study uses reflections as a theoretical framework in the interpretation, understanding and challenges teachers faced in teaching with learning technologies in inclusive education. The reflection is defined by Dewey (1938) as a performance of an individual where one actively and consistently involves in contemplation of related experience and practice to make it more meaningful and successful. For Schön (1983) reflection is the element that turns experience into learning. This concept has been acknowledged as important element of effective teaching and it was from that continuing conversation that the term "reflective practitioner" emerged (Schön, 1987). Accordingly, reflective practitioner is someone who actively engages in thinking about teaching with the express intent that reflections about those experiences to inform future practice (Arslan, 2019). There are different dimensions of reflective practice, consistent with Schön (1983), reflection on-action is a reflecting on how practice can be developed, changed or improved after the event has occurred and reflection-in-action is reflecting on the situation while changes can still be made to affect the outcome, rather than waiting until a later time to reflect on how things could be differently in the future. Critical reflection is another type of reflection that is defined by Mezirow (1997) as a transformative learning in that we are encouraged to view learning as a process of becoming aware of our own assumptions and revising them. Cranton (2002) purports that critical reflection is "the means by which we work through beliefs and assumptions, assessing their validity in the light of new experiences or knowledge, considering their sources, and examining underlying premises" (p.65) in the teaching practice. However, though there are different types of reflections in teaching practice, Tajik and Ranjbar (2018) observe that teachers do not see the value of reflecting in their own teaching practice. From the backdrop of teachers

lacking skills and knowledge of implementing inclusive education and how to teach with learning technologies, the research question this study is addressing is: *What are the teachers' reflections in the use of learning technologies in inclusive education*? Therefore, aim of this study is to explore teachers' reflections in the use of learning technologies in inclusive education.

METHODOLOGY/METHOD

This study employs a qualitative case study research design that involves an intensive and holistic examination of a contemporary phenomenon in a real-life setting (Yin, 2014). A case study is used to explore, describe or explain a single case bounded in time and place (Creswell & Poth, 2018; Swanborn, 2010). The case in the context of this study is to explore teachers' reflections in the use of learning technologies in a school of learners with special educational needs in the West Rand District in Gauteng Province. The school has computer laboratory provided by Gauteng online laboratory project (GDE, 2005). There are a total of 15 staff members in the schools and six teachers were purposefully selected in this case study based on their experiences in the teaching of LSEN. Learners at the school range from the Severe Mentally Handicapped (SMH) to the Mild Mentally Handicapped (MMH), terms that emanate from medical reports which learners bring to the school as an admission requirement. All learners had been referred either by the Medical staff or the District Based Support Team (DBST) from the Education District Office. A learner profile is then devised in which barriers to learning are specified, then the level and nature of support is identified to formulate a support plan.

Data collection

A semi-structured focus group interview with six teachers was conducted in order to gain an in-depth understanding of how they reflected in their teaching practice when using learning technologies in accommodating LSEN. Two teachers who participated in the focus group interview were further asked to participate in individual interviews in order to elaborate further on how they reflected in their teaching practice when using learning technologies in inclusive education. Observation was used as a method of data collection and six teachers were observed how they used learning technologies for LSEN in the laboratory. Documentary sources that are relevant were used to describe the case of how teachers used technological tools to support LSEN and for their professional development.

Data analysis

This study used a qualitative content analysis as a method for systematically describing the meaning of collected qualitative data (Schreier, 2012). This method is used for the description and interpretation of textual data using the systematic process of coding by assigning successive parts of the collected data to the categories and sub-categories (Assarroudi, Nabavi, Armat, Ebadi, & Vaismoradi, 2018) according to a reflection as a theoretical framework of this study. The analysis is done as a way of answering the research question.

RESULTS

The research question this study is answering is: What are the teachers' reflections in the use of learning technologies in inclusive education? In order to answer this question, this inquiry uses teachers' reflections as a theoretical framework (Schon, 1987) to interpret and understand the challenges teachers faced in teaching with learning technologies in inclusive education. Accordingly, the established categories within the reflection framework are discussed below.

Teachers reflected on-action and in-action that the learning technologies policies are not implemented by the school leadership and management

Teachers reflected on-action (that is, on the current situation that could be changed or improved) and reflected in-action (that is, in the current situation and what could be changed or improved in the future (Schon, 1987). However, in the context of this study, it was evident that the leadership and management structure of the school were not using learning technologies policies in the teaching and learning as envisaged by teachers. One of the teachers from individual interviews acknowledged that the school was not using ICT policies, indicating that: "*Policies in ICT are in place but we use policies in LTSM (Learner Teacher Support Material) and not policies of ICTs*

for teaching and learning". This comment by this teacher is corroborated by another teacher that: *"yes, no ICT policy is used for teaching and learning*". Management and leadership have not formulated a clear strategy or a timetable for both the teacher sand learners to have access to the computer laboratory as stipulated by policy document of Gauteng Online ICT laboratory (2005). One teacher reflected that when she has to have access to the laboratory: *"…you have to wait so you can take your learners to go down there to the computer laboratory*". This teacher's reflection shows that teachers limited access when they have to take learners to the computer centre (Navsaria, Pascoe, & Kathard, 2011). Regarding encouragement by the management to integrate learning technologies into learning and teaching, another teacher reflected that that: "*There is not enough support, each and every individual will have to see to it, out of your own you have to see how you're going to integrate, you have to make your own initiative only because, it's not only that we are going to use as a resource*". A lack of support can be attributed to the lack of vision amongst the leadership and management structure of the school to develop ICT policies that support the use of ICT tools for achieving educational goals (Sangrà & González-Sanmamed, 2010).

Teachers reflected in their teaching practice that they adapted the mainstream ICT curriculum to the level of learners with special educational needs

Teachers' reflection is viewed as a necessary tool to develop and sustain responsive instructional practice to accommodate the needs of their learners (Wenner, 2017). Unfortunately, the school did not have the ICT curriculum, and in answering this question: Do you have a special curriculum for LSEN? One teacher responded: "*No*", and in adapting the mainstream ICT curriculum another teacher from focus group interview confirmed that: "*Yes it is adapted*". To be able to modify or adapt the pedagogical approach, teachers are encouraged to employ new teaching method using ICT (Martínez, 2011). However, this presented a challenge as they have to modify their approach. One teacher reflected that: "*If you struggle with a curriculum, I mean let alone the integration of the ICT. Can you imagine what is happening, it's a serious challenge*". Another teacher corroborated what had been said by her colleague about the struggle they experienced when teaching LSEN: "*There are different kind of disabilities, one with involuntary movement, arthetoid, cannot even type because his hands are shaking all the way. Some who are partially sighted, whereby we do not have the Braille computers*". Despite the challenges teachers used available ICT tools, as reported by one teacher: *"… some pictures and specific programmes, Microsoft Word for that PowerPoint*" in the teaching and learning process. Another teacher pointed out that the use of available ICT tools can meet and improve learners' skills in the use of digital resources: *"…you have learners who are able to comprehend (MMH) what you are teaching them but they cannot put it on a written page. And you know I think ICT tools provide for us a way of adapting the curriculum, to reach the through different means of methods. So, I think ICT are the best, if we can get different programmes*". Teachers' reflection in adapting and using available ICT tools to teach learners is supported by Lersilp and Lersilp (2019) that adapting ICT tools to the instructional activities of the learner will make them to perform in the classroom.

Critical reflection enabled teacher to reflect on your own limit of ICT skills in the teaching activities in the classroom

Critical reflection provides opportunities for a teacher to question himself/herself on aspects one would rather not see or know so as to reach higher levels of thinking and action and to recognise one's lack of abilities and competences. Furthermore, it provide the basis for individual and group empowerment (Mezirow, 2006). The use of ICT in the classroom should support and enhance learning, teaching and inclusion, and despite the lack of teachers' competence and ICT skills, learners were able to complete the activities. One teacher confirmed that: *"… they work with this thing to get to the end product. I think it works well they can draw they can insert, they can even print, looking at what they have done"* (Circular 71/2008). The confirmation that learners can use ICT tools to complete the activities was supported by her colleague: "*Yes, on the ICT there are some who benefit because some are fresh from the mainstream, and because of being slow learners sort of, so now when they come here they are working with their own pace*". Teachers reflected that the use of ICT tools can support learners who are under-achieving: *"I think it can be used more especially in the LSEN school because we have learners who are able to comprehend*

what you are teaching them but because they cannot put it into writing, because of in a school of LSEN, fine motor skills are not yet developed. With the use of the keyboard or mouse they can be able to give you the correct answer". Teachers were aware that any ICT tool that is available can be used to support learners in accomplishing their learning activities. One teacher from individual interviews pointed out that learners were struggling with skills in the learning process in that: *"our learners are struggling from reading, writing, understanding communication, all those things*". Mezirow (2006) and Morrow (2011) conclude that when teacher use their critical reflection to transform their teaching practice, their limited skills and competence can be used to introduced to a new method of learning in the classroom.

Through critical reflection teachers reflected that they need professional development to use ICTs in inclusive education

Critical reflection is both systematic and rigorous in the reflective practice as it is essentially from an epistemological discourse perspective, focusing on reflection as a way to understand what we do (Hickson, 2011). In expressing this view about reflecting as a way to understand what teachers do and need in the use ICT in teaching practice, one teacher from the focus group interview reflected that: "*From my development plan, ICT was amongst the list of the things that I have requested, but requested workshop about learners with educational needs, am still waiting for those particular training as I've requested*". Teachers also pointed out the need to identify the type of professionalism required in the use of ICT for their school, for example: *"…most of the workshops that we got only comes from the district, … type of programme that do not fit for our school*". ICT can be an effective tool in supporting teaching practice and teachers were given laptops. However, one from individual interviews teacher said: "*giving us the laptops to try something. So I did not get the support that I expected from you as well, so I did not go anywhere because I felt frustrated. I really wanted to try that but I felt frustrated because it was so complicated*". An important element in teachers' professional development is the quality of support and training they receive in terms of planning, implementation and reviews. Fook and Askeland, (2006) confirm if teachers can reflection and be able to analyse their assumptions in their teaching practice, they will see the value of professional development in the use of learning technologies.

Critical reflection enabled the teacher to reflect on the need for professional support in addressing their attitudes towards ICT in their teaching practice

Leadership and school management must take the lead in creating a vision that motivates and changes teachers' attitude towards teaching using ICT tools. Critical reflection could be thought as a process of thinking about the conditions for what one is doing and the effects" (Steier, 1991, p.2) and about their own assumptions or attitudes and that can be revised (Mezirow, 1997). During the interview one teacher raised the view that: "*You know training in itself is not the only way, because it is also about the individual attitude of the educator. I would say change is not easy, how do we change the attitude of an individual? You can't, some are just afraid. If you could call a meeting and ask what is your greatest fear, they know but what is in them does not change, even teachers have barriers, I would recommend counselling of teachers*". On probing as to whether teachers have an attitude towards the use of ICT tools in the classroom, another teacher responded: "*Yes they have an attitude, they have a well-developed negative attitude towards the computer lab. Because maybe they think, or they undermine themselves for their knowledge that they have*". Support and proficiency in the use of ICT tools by teachers can help them overcome their fear, as indicated by one of the teachers: *"…maybe if they would know how computers works or how ICT makes their lives easy teaching is very simple with computers and that can change the attitude*". Another from focus group interview added that support for teachers "…*will also eliminate the fear of educators who are … afraid to go there because of the fear of the unknown*". According to Umugiraneza, Bansilal. and North (2018), if teachers are supported in the use of ICTs, they develop positive attitudes towards them in the teaching and learning processes.

Teachers reflected that the timetable structure of the school limit them to access the use of ICT resources for teaching and learning

The GED (2005) schools for LSEN are allocated special budgets to procure ICT, making it possible for teachers to access various forms of currently available technology. The availability of ICT resources was confirmed from individual interviews by one teacher: *"…we have laptops, Mimiopads, overheard projectors, the white boards, video cameras, digital camera*". Despite the availability of ICT tools, teachers have limited access to the computer lab as a result of the school's timetable structure. One teacher reflected that: *"… but for the purpose of teaching and learning I have not been because we go with the timetable… So we have not had the chance yet to use the computer lab*". Another teacher also experienced that: *"Maybe your times come and teach for that period maybe for a month. With the computer you need to be there every day, you have to practice it every day to understand it better*". It was evident during the observation that the system of timetabling denied teachers access to the laboratory. It is also was evident from the reflection made by one of the teachers that: "*I have to indicate by resources what am going to teach, use posters, maybe or real objects. Maybe I can add ICT, like in computer as the source am going to use, but it doesn't actually appear as part of the tool that you real are going to use generally, hence I say it's not integrate, it's been treated in isolation*". Even with the abundance of technological resources, teachers were not able to use them within the curriculum as a result of the structure of the school's timetable. Sangrà et al., (2010) also reflected that the quality of learning can be improved if teachers have unlimited access to resources and services.

DISCUSSION OF RESULTS

Teachers reflected that the learning technologies policies are not implemented by the school leadership and management. This is corroborated by teachers in that though ICT/learning technologies policies in the school they are not used for teaching and learning instead Learner Teacher Support Material are used. This is inconsistent to the White paper on e-Education and Gauteng online laboratory project and Guidelines for teacher training and professional development. Similarly, teachers reflected that there is no proper plan for accessing the computer laboratory for teaching and learning. Due to a lack of a special ICT curriculum for LSEN, teachers adapted the mainstream ICT curriculum to the level of learners with special educational needs, irrespective of the challenges they faced in the teaching learners with learning disabilities.

Critical reflection enabled teacher to reflect on your own limitation of ICT skills in the teaching activities in the classroom. This reflection gives the teachers the opportunity reflect on their own assumptions, strengths or weaknesses. Despite teachers' lack of competence and ICT skills, learners were able to complete the activities. Furthermore, through critical reflection, teachers acknowledged that they need professional development to use learning technologies in inclusive education, workshops they attended or training do not fit or help their school. Since critical reflection enables one to reflect on one's assumptions and beliefs, teachers reflected that they also need professional support in addressing their attitudes towards the use of ICT in their teaching practice and to eliminate fear of the unknown of using technology.

Teachers reflected that the timetable structure of the school limit them to access the use of ICT resources for teaching and learning. Teaching with learning technologies one needs to have access to the computer laboratory at least every day but unfortunately that is not the case, as there is no timetable or poster to access the computer laboratory. Using computers at the school is treated in isolation. During teachers' teaching practice, they reflected that learning with learning technologies, learners had positive outcomes in the learning process irrespective of their learning levels or the differences in the learning areas.

CONCLUSION

The reflection as a theoretical framework of this case study is an active and careful consideration of one's belief and knowledge in a given situational context. At the same time, the reflection can be a blending of two stages that occur in the teaching practice, that is, reflection after the event being integrated and the reflection that occurred during the event to provide a focus on ongoing improvement. Furthermore, in the teaching practice, teachers are becoming aware of their own assumptions and can revised them as a result of their critical reflection. Thus, aim of this study is to explore teachers' reflections in the use of learning technologies in inclusive education. The research question that this study answered is: What are the teachers' reflections in the use of

learning technologies in inclusive education? This is how the research question was answered - teachers reflected that (i) learning technologies policies are not implemented by the school management; (ii) they adapted the mainstream ICT curriculum to the level of learners with special educational needs; (iii) on your own limitation of ICT skills in the teaching activities in the classroom; (iv) they need professional development to use ICTs in inclusive education; (v) the need for professional support in addressing their attitudes towards learning technologies in their teaching practice; (vi) the timetable structure of the school limit them to access the use of ICT resources for teaching and learning and (vii) learning with learning technologies learners can comprehend in the learning process.

Recommendations and scope for further research are needed, since only six teachers participated in this study out of 15 teachers and it is recommended more teachers be part of enquiry. Only teachers participated in this study, a further study is needed that include learners' reflections in the learning with learning technologies.

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